

**State of Colorado**  
**Oil and Gas Conservation Commission**

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FOR OGCC USE ONLY

**RECEIVED**  
**4/11/2012**

## SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

☐ Spill ☐ Complaint  
☐ Inspection ☐ NOAV

Tracking No:

### CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☒ Site/Facility Closure ☐ Other (describe): \_\_\_\_\_

OGCC Operator Number: 16700

Name of Operator: Chevron USA, Inc.

Address: 760 Horizon Drive

City: Grand Junction State: CO Zip: 81506

Contact Name and Telephone:

Eric Page

No: Cell: 832.439.3832 Office: 713.372.1022

Fax: NA

API Number: 045-10714

County: Garfield

Facility Name: Skinner Ridge

Facility Number: 286035

Well Name: SKINNER RIDGE 698-12-01

Well Number: 324306

Location: (QtrQtr, Sec, Twp, Rng, Meridian): NWSW 12 6S 98W Latitude: 39.5444630 Longitude: -108.284240

### TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Produced water, condensate, drilling cuttings

**Site Conditions:** Is location within a sensitive area (according to Rule 901e)? ☐ Y ☒ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Non-crop land

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Tosca channery loam

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Deer Park Gulch and Clear Creek

**Description of Impact** (if previously provided, refer to that form or document):

Impacted Media (check):

☒ Soils☐ Vegetation☐ Groundwater☐ Surface Water

Extent of Impact:

Impacted soils in lined pit, no impacts below liner.

How Determined:

See attached analytical results and sampling plan.

### REMEDIALATION WORKPLAN

**Describe initial action taken** (if previously provided, refer to that form or document):

Initial work at this location consisted of the removal of the netting material and fencing in order to access the pit. The exposed liner material that was on top of the pit contents was removed using an excavator. All pit material was shaken off the liner while it was being removed. The liner material was then cut into manageable sized pieces and was stored temporarily in a bermed area at the pit location.

**Describe how source is to be removed:**

Excavation of the pit material occurred on 9/23/11. This material was stockpiled within a bermed area on the well pad. Excavation continued until there were no visual impacts observed after the lower pit liner was encountered. Confirmation samples were collected from the western floor of the excavation and the north and east walls on 9/29/11. Sample results are presented in Table 1 as 12-1 "sample location" CONF.

**Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed**

**facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:**

Pit contents were mixed with approximately 1,260 cy of soil from a nearby borrow area and tested to verify that constituent concentrations in mixed soil did not exceed COGCC regulatory requirements summarized in Table 910-1 as listed on the attached Table 1. The mix ratio was determined by analyzing three bench scale mixes of borrow material to pit contents (1:1, 2:1, 3:1) presented in Table 1 and identified as 12-1 BENCH "mix ratio". Based on these results, the Pit 12-1 material was mixed at a ratio of 3:1 to meet COGCC allowable limits and provide adequate volume to backfill the pit.

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Page 2  
**REMEDIATION WORKPLAN (Cont.)**

Tracking Number: \_\_\_\_\_  
Name of Operator: \_\_\_\_\_  
OGCC Operator No: \_\_\_\_\_  
Received Date: \_\_\_\_\_  
Well Name & No: \_\_\_\_\_  
Facility Name & No: Pit # 286035

OGCC Employee: \_\_\_\_\_

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.)  
Impacted material was excavated until clean native soil was observed and tested. No groundwater was observed, therefore groundwater was not impacted from the pit.

**Describe reclamation plan.** Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.  
The pit contents were mixed with soil from the borrow area at a ratio of approximately 3:1. Mixing occurred by placing one loader bucket of pit material into the pit, then placing 3 loader buckets of borrow material into the pit and mixing the material in the pit with an excavator until well mixed. The material was then compacted by wheel-rolling the material with the front-end loader. Samples were collected from the backfill material. These samples were collected from the south, center, and north areas of the pit at random depths. The results of these backfill samples are located in Table 1 and are identified as 12-1 BACKFILL "backfill location". The final surface was graded to match the existing elevation of the well pad and will be utilized as a traffic area.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☒ N If yes, describe:

Based on the backfill and pit confirmation sample results, further investigation is not required. Three background soil samples were collected from the edges of the well pad away from the 12-1 pit and analyzed for Sodium Adsorption Ratio (SAR), pH, Arsenic, and Specific Conductivity to justify elevated levels for these constituents in the backfill and confirmation samples. The backfill and confirmation results have arsenic and pH levels above COGCC allowable limits. However, the background samples show comparable concentrations of arsenic and pH. The confirmation and backfill samples have elevated sodium adsorption ratio (SAR), pH, and arsenic above COGCC allowable limits. According to COGCC regulations section 910.b.(3).E, "Where EC of the impacted soil exceeds the level in Table 910-1, the sodium adsorption ratio (SAR) shall also be determined." The electrical conductivity (EC) of the confirmation and backfill samples are within COGCC allowable limits.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

Pit contents were mixed with borrow soil and backfilled within the closed pits.

**IMPLEMENTATION SCHEDULE**

Date Site Investigation Began: <u>6/6/11</u>	Date Site Investigation Completed: <u>6/8/11</u>	Date Remediation Plan Submitted: <u>7/11/11</u>
Remediation Start Date: <u>8/23/2011</u>	Anticipated Completion Date: <u>11/30/2011</u>	Actual Completion Date: <u>10/3/2011</u>

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: ERIC PAGE Signed: [Signature]  
Title: Chernobyl Project Manager Date: 4/10/12

OGCC Approved: [Signature] Title: For Chris Canfield Date: 04/13/2012  
EPS NW Region

**Table 1**  
**Chevron Piceance Pits**  
**Pit 12-1**

Sample Summary															
Sample Location	12-1 0:1 BENCH	12-1 1:1 BENCH	12-1 2:1 BENCH	12-1 3:1 BENCH	12-1 NORTH FLOOR CONF	12-1 SOUTH FLOOR CONF	12-1 WEST WALL CONF	12-1 BKGD EAST	12-1 BKGD NORTH	12-1 BKGD SOUTH	12-1 BACKFILL CENTER	12-1 BACKFILL NORTH	12-1 BACKFILL SOUTH		
Sample Type	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite		
Sample Date	8/31/2011	8/31/2011	8/31/2011	8/31/2011	9/27/2011	9/28/2011	9/27/2011	9/12/2011	9/12/2011	9/12/2011	9/29/2011	9/29/2011	9/29/2011		
Laboratory Data Summary															
Analytical Parameters														COGCC Allowable Limits Table 910-4	Units
<b>Organic Compounds</b>															
TPH-Total	222	195.8	240.4	224.5	82.7	49.7	78.3	NA	NA	NA	222	436	397	500 (Comb)	mg/kg
Gasoline Range Organics	ND	30.8	23.4	23.5	ND	ND	ND	NA	NA	NA	ND	ND	ND	*	mg/kg
Diesel Range Organics	222	165	217	201	82.7	49.7	78.3	NA	NA	NA	222	436	397	*	mg/kg
Benzene	0.0192	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.17	mg/kg
Toluene	0.0412	0.0092	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	85	mg/kg
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	100	mg/kg
Xylenes, Total	0.104	0.0616	ND	0.0399	ND	ND	ND	NA	NA	NA	ND	ND	ND	175	mg/kg
Acenaphthene	0.0356	0.0351	0.0279	0.0268	ND	ND	ND	NA	NA	NA	ND	0.0429	ND	1,000	mg/kg
Anthracene	ND	0.0086	0.0076	0.0068	ND	ND	ND	NA	NA	NA	ND	ND	ND	1,000	mg/kg
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.22	mg/kg
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.022	mg/kg
Benzo(b)fluoranthene	0.0099	0.0063	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.22	mg/kg
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	2.2	mg/kg
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.22	mg/kg
Chrysene	0.0275	0.0143	0.0077	0.0069	ND	ND	ND	NA	NA	NA	ND	ND	ND	22	mg/kg
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.022	mg/kg
Fluoranthene	0.013	0.0098	0.0065	0.0057	ND	ND	ND	NA	NA	NA	ND	ND	ND	1,000	mg/kg
Fluorene	0.107	0.0762	0.0533	0.0538	ND	ND	ND	NA	NA	NA	0.0411	0.103	0.064	1,000	mg/kg
Naphthalene	0.473	0.328	0.203	0.204	ND	ND	ND	NA	NA	NA	ND	0.23	0.175	23	mg/kg
Pyrene	0.0266	0.0258	0.0212	0.0178	ND	ND	0.0047	NA	NA	NA	ND	0.0468	0.0433	1,000	mg/kg
<b>Physical Properties</b>															
Sodium Adsorption Ratio	57.2	13	7.2	8.6	53.3	34	45.2	1	ND	ND	6.9	11.8	10.8	<12	
Specific Conductivity	1.82	1.71	1.68	1.4	0.348	0.392	0.302	0.0825	0.0774	0.0675	0.257	0.252	0.334	<4	mmhos/cm
pH	11.1	8.9	8.6	8.6	10.2	9.9	10.3	9.2	8.3	8.5	9.7	9.8	9.9	6 to 9	Std. Units
<b>Metals</b>															
Arsenic	4.5	11.1	11.6	13.6	13.4	17.6	21.1	16.9	21	16	17.2	11.3	13.2	0.39	mg/kg
Barium	7790	4970	3630	3330	282	319	292	NA	NA	NA	2430	3810	2540	15000	mg/kg
Cadmium	ND	ND	ND	ND	ND	ND	0.73	NA	NA	NA	ND	ND	ND	70	mg/kg
Chromium, Hexavalent	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	23	mg/kg
Chromium, Trivalent	15.3	19.8	20.8	19.8	17.3	19.7	22.8	NA	NA	NA	16.7	18.6	18.9	120000	mg/kg
Copper	51.7	33.1	29.6	24	17	21.5	33.4	NA	NA	NA	24.5	27	31.2	3100	mg/kg
Lead	33.7	12.5	13.4	11.1	8.5	10.1	19.8	NA	NA	NA	11.1	12.5	13	400	mg/kg
Mercury	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	23	mg/kg
Nickel	13.3	14.9	17.5	14.8	12.1	12.9	14.7	NA	NA	NA	12.8	15.8	15.1	1600	mg/kg
Selenium	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	390	mg/kg
Silver	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	390	mg/kg
Zinc	60.3	49.1	57.4	52	43.5	46.6	57.2	NA	NA	NA	46.3	56.9	49.1	23000	mg/kg

NA = Not analyzed  
ND = Parameter reported under detection limit  
mg/kg = milligrams per kilogram  
mmhos/cm = milliohms per centimeter  
Federal Register, COGCC Allowable Limits